

An Environmental Impact Statement

# The Rehabilitation of Blundells' Swamp



## **REHABILITATION OF BLUNDELLS' SWAMP.**

**Sydney REP 20 Wetland No. 94**

**This E.I.S. is in support of two applications to construct earthworks to partially restore natural water levels in this wetland which have been artificially lowered by drainage. The applications are made by S. E. Bellantonio, R. P.C. Molesworth and by the Blundells' Swamp Co-op. Ltd. for works on their respective landholdings (see map 1). The first two have owned part of the wetland and been working for its preservation since 1971, and the Co-operative was formed in 1977 with its primary object "to undertake the care and management of Blundells' Swamp Wildlife Refuge". The Refuge was gazetted on 26th October, 1984.**

# **CONTENTS**

**PART ONE : The Wetland, Its Destruction by Drainage and Efforts towards its Rehabilitation.**

**PART TWO : The Impact of the Works.**

**PART THREE : Conclusions.**

**APPENDIX A ; Survey Report.**

**APPENDIX B : Comments by Relevant Authorities and Experts in the Field of Natural Heritage Conservation.**

## **PART ONE :**

# **The Wetland, Its Destruction by Drainage and Efforts towards its Rehabilitation.**

### **1. PRELIMINARIES.**

**1.1 All levels expressed in figures are derived (unless otherwise stated) from the survey conducted on our behalf by Norman Bruhn, Registered Surveyor (Appendix 1), and all refer to metres above Australian Height Datum.**

**1.2 "The Council" means the Baulkham Hills Shire Council unless otherwise stated.**

**1.3 "The R.E.P." means Sydney Regional Environmental Plan No. 20.**

**1.4 "Flood" refers to the river overflowing its banks.**

**1.5 "Full" in relation to the Wetland refers to its natural maximum level (2.94 metres). Inundation to that level is sometimes elsewhere referred to as a flood and 2.94 m. as "the flood line or "the nuisance flood level". These practices are not adopted here.**

### **2. THE WETLAND.**

**Blundells' swamp is a 30 ha. (approx.) Hawkesbury River Freshwater Wetland at Lower Portland. It and other Hawkesbury Wetlands, have been identified as having high conservation value by G.N. Goodrick (CSIRO Technical Memo 1970), and this swamp is specifically noted by J. Moss (S.P.C.C. Studies Branch 1979 - numbered 45) and by the Herbarium study (Ecology Section Royal Botanic Gardens 1986 - numbered 94, see Appendix B). It has provided regular habitat for black duck, wood duck, little grebe, black swan, swamp hen, plover, white faced heron, white necked heron and on occasion many others species. It is owned by eight separate entities (including the Crown and the Council) and is part of nine separate parcels of land (see Map 1). Its boundaries have never been surveyed but is best described as that area of land within the nine parcels that lies below 2.94 m A.H.D. It is part of a natural water course that drains a catchment of approximately 7 square kilometres.(see Map 2).**

**It was formed thousands of years ago by the action of flood water building up the river bank to a higher level than some of the land behind it,**



(i.e. forming a natural levee). These natural embankments retained flood and rainwater up to the level of 2.94 m. but allowed any further water to flow along the water course to the river. This retained water supported an abundance of vegetation which over the centuries grew and decayed and thereby changed the nature of the soil within the swamp's boundaries. The depth of this wetland sediment is not known, but it is at least 2 metres, which attests to the extremely long time frame for the existence of this water level. For the most part it is quite easy to find the natural high water line of Blundells' Swamp, because the soil change is accompanied by a clear change in vegetation (see photo 1).

Close examination of photo 1 also reveals that the line of debris deposited when the swamp is full is at the same 2.94 m level. Further evidence of the high water line and the length of time it has existed is offered by "hamburger rock" which has a deep line of wave erosion at 2.94 m (see photo 2). Photo 3 shows this erosion line exactly matching with the line of the vegetation change.

How long the swamp remained full would depend on the season and the weather patterns - the amount of rainfall, the speed of evaporation and the occurrence of flooding on the river. The level would fluctuate from full to completely dry.

All this is confirmed by our observations of the behaviour of the wetland over more than 20 years. Although it has been artificially drained over much of that period the patterns are much the same except that, obviously, levels drop more quickly and the swamp is too often dry. We have also had the opportunity to see, for a brief period in the mid 1980s', the wetland operating in its natural way. At that time the drainage works, abandoned for decades, ceased to function. River Road was sometimes cut for two months at a time if the swamp receded slowly in periods of low evaporation. The whole area teemed with wildlife as waterfowl nested (as they do) in anticipation of the abundant food supply obtained from falling water, and pelicans and swans, and flocks of ibis and herons took up temporary residence.

The swamp was completely drained by 1988, possibly in response to landholder pressure.

### **3. DRAINAGE.**

#### **3.1 History.**

The entire history of the drainage of this wetland is not documented. At some time in the past considerable efforts were made to drain the swamp, presumably for agriculture. Channels were dug over most of its area

leading to a pipeline (see Map 1) which follows the natural watercourse but at a much lower level. By the time some of the applicants became associated with the area (in 1971) these works had been abandoned, the channels had become silted up and the pipeline partially blocked. The swamp would fill up after floods and heavy rain to 2.94 m. and then over 6-8 weeks drain to 2.11 m. at which point it was retained by the ground level immediately to the east of River Road, and at a similar level on the western side of River Road by the rise of the land. Any reduction below that level was slow and by way of evaporation or seepage.

As time passed the 2.11 m. level was maintained but the drainage from 2.94 m. to 2.11 m. became slower and slower as the drainage system deteriorated. Finally it ceased altogether due to collapse in the pipeline.

### **3.2 Destruction by Drainage.**

All the material facts with respect to these drainage works are not clear but our enquiries enable us to draw a number of conclusions.

The owner of lot 3, DP 25576, Mr Dave Meagher executed considerable works including radically deepening the channel immediately before the start of the pipeline (see Map 1) and digging out and replacing collapsed sections of the pipeline itself. (Meagher, personal conversation.) He has also told us that he was one of several owners complaining to the Council about the "flooding" and the road being cut for longer periods, and that as a result of this the Council dug out and cleared an obstruction at the sharp bend in the pipeline in lot 1, DP 25576, (see Map 1) and inserted an access hole and cover to facilitate clearing of future blockages; and also dug a deep sump on its own land next to River Road (see Map 1 and photo 5) which prevented water being retained at the 2.11 m level. Mr Meagher and the Council's Engineers have indicated that these works by the Council are regularly maintained up to the present.

Apart from what we have been told, we know from other evidence that this work was done. Photo 4 clearly shows the marks of the the tines of the excavator or back-hoe used to deepen the channel on Mr Meaghers' land. The steep uneroded sides of the sump and channel adjacent to River Road are evidence of a recent excavation (see photo 5). Photo 6 shows the surveyor's assistant taking the 2.11 m. level alongside the same excavation.

We first became aware of these works in early 1988, because of the changed behaviour of this Wetland. The drainage from full to 2.11 m, instead of taking eight weeks (or more in the years immediately prior),

took four weeks or less. Furthermore, instead of stopping there, it continued to drain quite rapidly to a few ponds, which completely dried out other than during exceptionally rainy weather.

The result of the works was that Blundells' Swamp ceased to exist. The water fowl departed except for occasional visits during rainy conditions, the amphibians disappeared and by 1991 the bed of the swamp was dry to a depth of 1.5 m. below ground.

### **3.3 Steps taken by us.**

**3.3.1.** It is clear that since as early as 1988 there has been a lack of communication with respect to the amount of drainage already done by Council and the adjoining owners, and what appropriate steps should and could have been taken to remedy the deterioration of the wetland. In addition, enquiries during that time had led to a general belief that the draft Hawkesbury-Nepean River R.E.P. was unlikely to proceed.

By 1991 the swamp had dried out 1.5m below its bed and all the aquatic wildlife had departed. The animals, reptiles and non-aquatic birds that had been attracted by the water and lush vegetation had become extremely scarce and, furthermore, the sedge (*Eleocharis Sphacelata*) which are kept in check by either the water being too deep (not the case at 2.11m level) or by being covered by silt-laden floodwaters for considerable periods, had thickly colonised the whole swamp, leaving little open water, preventing water flow and providing approach for predators to potential breeding sites.

In 1991 certain works were carried out to make some attempt to re-establish the wetlands and the pre-1988 regime. The extent of those works are as follows :

- (i) In the position of levee "B" shown on Map 1, a bank was pushed up with the intention of restoring water levels to their pre-1988 level, i.e. 2.11m. Subsidence on the Southern end caused the spillway to be subsequently lowered to 1.77m.
- (ii) In the portion of levee "A" on Map 1 another bank has been erected. This has two purposes : to block a drainage ditch and retain initial run-off from the catchment (at 1.79m) and to provide a dry working platform over the deeper part of the swamp to enable the bank to be raised at a later date to retain water at the 2.94m level, if approval could be obtained.

(iii) To the Western side of levee "A" two islands were pushed up to allow safe nesting for water fowl, and to the South of those an area was excavated to below the level where the sedge (*Eleocharis Sphacelata*) usually grows, so as to provide an area of open water. (It is our experience that the number of waterfowl is dependant on the availability of both deep and shallow water and of safe nesting). As can be seen from the survey (Appendix A) the edge of this excavation has slightly encroached on the reserve road.

### **3.3.2 Lodgement of the current Development Applications to**

- (i) Gain approval for the works already carried out.**
- (ii) Raise levee "A" to retain water at 2.94 m.**
- (iii) Raise levee "B" to retain water at 2.11 m.**

## **PART TWO :**

### **Impact of the Works.**

**As the existing and proposed earthworks are of the same type and have similar intentions it is proposed to treat them together.**

#### **1. IMPACT ON THE ENVIRONMENT.**

**The whole purpose of these applications is to make a positive impact on the environment. There is no disagreement amongst the experts as to the value of the wetlands to the Hawkesbury system, to wildlife and habitat conservation and to natural heritage conservation generally - see Appendix B. Nor is there any disagreement that the restoration of Blundells' Swamp would be a significant contribution to the Hawkesbury environment.**

**The only proper course of action is the cessation of all drainage, but that course is beyond our control. The measures proposed are half measures, but better than none at all.**

**1.1 It is not proposed to give a highly detailed assessment of the impact on vegetation, wildlife, hydrology and flooding for the following reasons :**

**This is in accordance with the instructions of the Department of Planning ( S91/06787, para. 4, see appendix B) and with the agreement of the Council (as set out in its letter of 8.12.93).**

**Levee "B" does not involve any change from the pre1988 situation as far as that part of the wetland it affects.**

**The returning of a Wetland to its natural water levels must, in the absence of powerful indications to the contrary, be regarded of itself as a desirable outcome. This would be so even if such a return involved a reduction of levels.**

**The Wetland in its natural state is retained by earthbanks and the substitution of constructed earthbanks will provide identical conditions, though on a smaller scale.**

**An increase in water levels provides a greater area and a greater variety of habitats, which necessarily increases the value for fauna and vegetation**

**Environmental matters are at the core of these Applications and are**

referred to throughout this document.

## **1.2 Description.**

Blundells Swamp is a large floodplain wetland formed as a backswamp behind a levee bank on the eastern side of the Hawkesbury River. Such swamps formed along the Hawkesbury during the period of rising sea level since the last glacial maximum approximately 18,000 years ago. Blundells Swamp occupies a long valley bounded by steep sandstone hillsides, almost all of which still retains its natural vegetation of dry eucalypt woodland and forest. Drainage from this sandstone catchment yields water low in nutrients.

Vegetation is semi-permanent freshwater swamp vegetation with zones varying in species composition according to seasonally fluctuating water levels. Tall Spike-rush, *Eleocharis sphacelata*, is common in the deeper areas, with patches of the paperbark *Melaleuca linariifolia* on the margins. In the shallower zones as water levels drop slowly in response to drying out, is seasonal swamp vegetation, characteristically of *Persicaria* species and native grasses.

Species present include *Alternanthera denticulata*, *Cynodon dactylon*, *Eleocharis sphacelata*, *Juncus usitatus*, *Melaleuca linariifolia*, *Paspalum distichum*, *Persicaria hydropiper*, *Persicaria praetermissa*, *Persicaria prostrata*, *Persicaria strigosa*, *Persicaria subsessile*, *Pseudoraphis spinescens*.

Blundells Swamp has high conservation status as Wetland Number 94 according to the report, Conservation Value of Natural Vegetation along the Hawkesbury-Nepean River by the Royal Botanic Gardens, 1986.

## **1.3 The Works.**

The precise design of the levees is not dealt with at this stage. It is proposed to do this in consultation with a suitably qualified engineer and officers of the Department of Conservation and Land Management (see appendix B). The aim will be to ensure the works create the minimum intrusion into the natural system compatible with good practice. It is anticipated the construction would take between one and two weeks and would cause no disruption to surrounding landholders. Noise and energy use would be minimal and at levels comparable to those involved in the construction of a small dam for agricultural use.

**1.4 Statement in respect of "Significant effect on the environment of endangered fauna" S4A Environmental Planning and Assessment Act 1979 No. 203.**

We reiterate that the purpose of the project is, insofar as we are able, to restore to its natural state the habitat of all fauna affected by it. In reversing the effects of drainage it extends the habitat of all species which inhabit wetlands.

The Threatened Species Unit of the National Parks & Wildlife Service has supplied the following list of endangered species.

PAGE 1							09:44:15 24 AUG 1993			
Key.....	COMMON NAME.....	SCI. NAME.....	FIRST DATE.	LAST DATE..	RECORDER.....	LAT..	LONG..	ACC	REL	
(i) WD5971	Giant Burrowing Frog	Heleioporus australiacus	01 JAN 1977	31 DEC 1977	White, A.	33:12	150:34	3	5	
(ii) WD14863	Red-crowned Toadlet	Pseudophryne australis	01 JAN 1977	31 DEC 1977	White, A.	33:12	150:34	3	5	
(ii) WD39272	Red-crowned Toadlet	Pseudophryne australis	24 AUG 1982	24 AUG 1982	Conroy, R.	33:12	150:33	3	5	
(iii) WD33313	Broad-billed Sandpiper	Limicola falcinellus	03 DEC 1982	03 DEC 1982	Conroy, R.	33:12	150:33	3	5	
WD10885	Brush-tailed Rock-wallaby	Petrogale penicillata	01 JAN 1977	31 DEC 1977	White, A.	33:10	150:33	3	5	
WD42817	Brush-tailed Rock-wallaby	Petrogale penicillata	05 JAN 1980	05 JAN 1980	Pulsford, I.	33:11	150:31	3	5	
WD33030	Koala	Phascolarctos cinereus	01 JAN 1977	31 DEC 1977	Anonymous.	33:10	150:33	3	5	
WD40167	Koala	Phascolarctos cinereus	01 JAN 1977	31 DEC 1977	White, A.	33:10	150:33	3	5	

The appropriate co-ordinates of Blundell's Swamp are 33° 25' 30" and 150° 54' 30".

The brush-tailed rock Wallaby (*Petrogale penicillata*) and Koala (*Phascolarctos cinereus*), being forest dwellers, will not have their habitat affected in any way and have not been considered in detail.

In relation to the remaining three (numbered (i), (ii), & (iii) above), we supply the following information in terms of S4A of the E.P.A. Act 1979.

(a) (i), (ii) & (iii).

The proposal temporarily affects approximately 5% of the total area of the Wetland in order to partially restore approximately 70%. Wetland habitats are spectacularly increased (from near zero) initially, and further increased following regrowth of disturbed areas.

**(b) (i) & (ii).**

**These species are particularly sensitive to destruction of habitat, and are seriously affected by the widespread draining of wetlands. While they have not been sighted in Blundells' Swamp, the reversal of drainage is considered a valuable addition to their habitat.**

**(iii)**

**This species migrates from Siberia, where it breeds, and is only rarely seen in South-east Australia. It inhabits a wide variety of shorelines, mostly marine, but also those of lakes and inland waterways. It is not considered to be sensitive to minor fluctuations in habitat.**

**(c) (i), (ii) & (iii).**

**There is no evidence that any part of Blundells' Swamp is a critical habitat. Refer to (a) above.**

**(d) (i), (ii) & (iii).**

**See (a) & (b) above. There is no evidence that the population of any endangered species is likely to be reduced.**

**(e) (i), (ii) & (iii).**

**In its drained state the wetland provides virtually no habitat at all for wetland fauna. In relation to that area directly affected by the works, as discussed elsewhere in this E.I.S., there has been and will be no off site siltation, or lowering of water quality and all plant species have and will regenerate in their new locations.**

**(f) (i), (ii) & (iii).**

**The area is not currently being so assessed.**

**(g) (i), (ii) & (iii).**

**There is no reason to believe that the works will have anything but a positive effect on the survival of endangered fauna.**

**It is submitted that a Fauna Impact Statement is not required. This view was discussed with Mr. Michael Watt of the Council at a meeting on December 1, 1993 and it was agreed that the E.I.S. would be lodged "based upon existing information".**



**1.5 The following specific areas of environmental concern have been addressed :**

**1.5.1 Possible loss of shallow water and replacement with deep water habitat : there will be no decrease, as the gently sloping ground (gradients as low as 1:15) readily provides new shallow areas as levels increase.**

**1.5.2 Possible reduction in natural fluctuations of water level : the constructed earthbanks will closely mimic natural banks with regard to seepage, evaporation, refilling and flooding - the determinants of fluctuation.**

**1.5.3 Effects on existing vegetation : we are advised by Royal Botanic Gardens (see appendix B) that with the possible exception of *Melaleuca linariifolia*, all species currently existing will migrate to their equivalent position under the restored hydrological regime. Some individual melaleucas may not survive, though it will be several years before this is known. Although natural regeneration will occur along the restored shoreline, this process will be assisted by planting trees grown from seeds gathered in the same area so as to ensure that there is no reduction in the number of surviving melaleucas and that genetic integrity is maintained.**

**1.5.4 Possible soil erosion, siltation and loss of water quality during construction. Observation of existing earthworks provides permanent visible evidence that wetland sediment is highly cohesive and is not subject to erosion, even when floodwaters flow over the whole length of the levees. Water quality has been and continues to be excellent. In addition, Mr Matt Corbett of the Dept. of Conservation & Land Management has inspected these works and noted that off-site sedimentation has not occurred, (see appendix B).**

## **Summary of impact on the environment.**

**The point is strongly made that there are no negative environmental effects resulting from the restoration of a wetland to its natural state. The negative effects of this proposal result from the fact that we are unable to prevent drainage along the pipeline and must resort to partial restoration by earthworks.**

**The banks themselves have been chosen as the method of retention as they will replicate the natural situation. All environmental values to the East of each of the levees will be the same as if those levees had been**

**natural earthbanks occurring in the same positions. All areas to the West of levee "B" will be drained as before. It must be remembered that levee "B" merely reinstates the pre 1988 situation by replacing the earth barrier on the Council's land adjacent to River Road ( now breached by excavation ) with a very similar earth barrier some 80 metres Westward.**

**It is submitted that our proposal offers the best, and the least disruptive method currently available for rehabilitating this Wetland.**

## **2. IMPACT ON ADJOINING OWNERS.**

Three adjoining owners may be affected by this proposal. The effects are by way of physical limitations to the kinds of activity that can be carried out within the boundaries of Blundells Swamp, resulting from the swamp fluctuating through its natural cycle, instead of draining more rapidly. These limitations are largely in place already as a result of the frequent filling of the swamp, and are limitations which we would urge upon the relevant authorities in any case. Even if these limitations create difficulties for current owners, that is certainly not true for all potential owners for all time.

**2.1** The most important factor to take into account when considering general impacts is that Blundells Swamp forms part of a natural watercourse that rises in the hills of and behind Por. 71, flows through the swamp proper and then along a defined channel to the Hawkesbury River. This last section has been modified by the laying of a pipeline which follows the watercourse, but at a lower level. The proposal partially reinstates and restores a pre-existing condition in the context of all the various parties' rights and obligations as riparian owners. The general view held after considering all matters is that in the context of the basic objectives of the Regional Environmental Plan pertaining to this area, all affected parties are better off and have an improved environmental benefit from the proposed works.

### **2.2 The Three Adjoining Owners.**

#### **2.2.1 The property of Mr. R. Jacobs.**

There is only one private landholder directly affected by this proposal - Mr. R. Jacobs, Por. 71. The effect will be that whereas now rain and floodwaters disperse rapidly by way of the natural watercourse to a level of 2.94 metres and then quite slowly by way of the drainage works, if the proposed works are carried out the water will drop below 2.94 metres only by the action of evaporation and seepage. The works will not increase the area of land prone to be under water, but will increase the length of time it remains so.

#### **2.2.2 Crown Land.**

As the survey ( Appendix A ) and Maps 1 & 2 show, considerable parts of the Crown Road are below the 2.94 m. level, parts are below the 2.11 m. level and virtually all is far below flood level. It is not possible to travel the length of the road without passing through the wetland for

**considerable distances.**

**The comments made at the introduction relating to the objectives of the R.E.P. are most applicable to the Crown Land.**

**It is quite clear that this road has never been made, is not required for and is not ever used for, any access to any land ( except to Por. 19 and Lot A across Lot 512 ). It does not connect with any public road and all other adjoining landholders have more suitable access**

### **2.2.3 Mr. J. Lorraine.**

**Mr. Lorraine does not own land which is affected by this proposal. Mr. Lorraine has approval (P6211/12998-1) to conduct a “recreational club” on Lot 1 DP559106, which land abuts the Western end of the reserve road.**

## **Summary of impact on adjoining owners.**

**Both in terms of achieving objectives relating to the R.E.P., increasing natural flora and fauna and in allowing the continuation of existing permitted adjoining activities this report concludes that the adjoining owners are substantially better off under the proposal.**

**The proposal, in addition, provides a balance between the competing interests and rights of various riparian land owners and is supported.**

## **PART THREE :**

### **Conclusion.**

**1.1 Photographs A, B & C, on pages 21 & 22, document the alteration to the ecosystem as a result of drainage :**

**Photo A : Blundells' Swamp looking East from River Road in 1986 - from "Taken for Granted" by Doug Benson & Jocelyn Howell, 1990.**

**Photo B : The same scene in 1991.**

**Photo C : Looking West from River Road in 1991.**

**On page 22, Photo D (Portion 19, Looking East, 1992) shows the result of partial rehabilitation.**

### **1.2 Alternatives to the Proposal**

**There are alternatives which would avoid the construction of levees and these are set out below :**

**1. Cessation of all drainage. This is the only proper course of action. It would restore the wetland to its natural state, allow the regrowth of vegetation and provide wildlife habitat under original conditions. Such a scheme has our unqualified support, but is not within our power.**

**2.(i) We are informed by the Engineers Dept. of the Council that survey and planning work has been done towards raising River Road where it crosses the swamp "above nuisance flood level" (ie. above 2.94 m). If this work were accelerated, and if the construction of the roadway was the same as it is now (earth fill between stone retaining walls), then the roadway could be used with a suitable overflow system to restore the level of that part of the swamp which lies to the East of it. As a solution it assumes that the intrusion of an earth-filled crossing is inevitable and seeks to combine the crossing and a levee in one. This would be less effective than total restoration but still better than what we are able to offer.**

**(ii) As an interim measure the refilling by the Council of the excavation on its land adjacent to River Road is a cheap and effective method of partial restoration and is highly recommended for immediate action.**

**3. The third alternative is to make no attempt at rehabilitation. This means acceptance of the destruction of Blundells Swamp and the consequent loss of amenity and vegetation and wildlife habitat.**

### **1.3 Submission**

**It is submitted that while the proposal does not offer a complete solution to the destruction of Blundells Swamp, it is the best practical compromise currently available, and is supported.**





**Photograph 1 : Shows line of vegetation change and high water debris at 2.94 m.**



**Photograph 2 : "Hamburger Rock" - shows wave erosion at 2.94 m.**





**Photograph 3 : Shows that wave erosion line and vegetation line correspond**



**Photograph 4 : Signs of machine excavation on Lot 3 D.P.25576 (1991)**





**Photograph 5 : Shows the recent excavation adjacent to River Road**



**Photograph 6 : Taking the 2.11 m. level.**





**Photograph A : Blundells' Swamp looking East from River Road in 1986  
(from "Taken for Granted" by Doug Benson & Jocelyn Howell, 1990).**



**Photograph B : The same scene in 1991.**

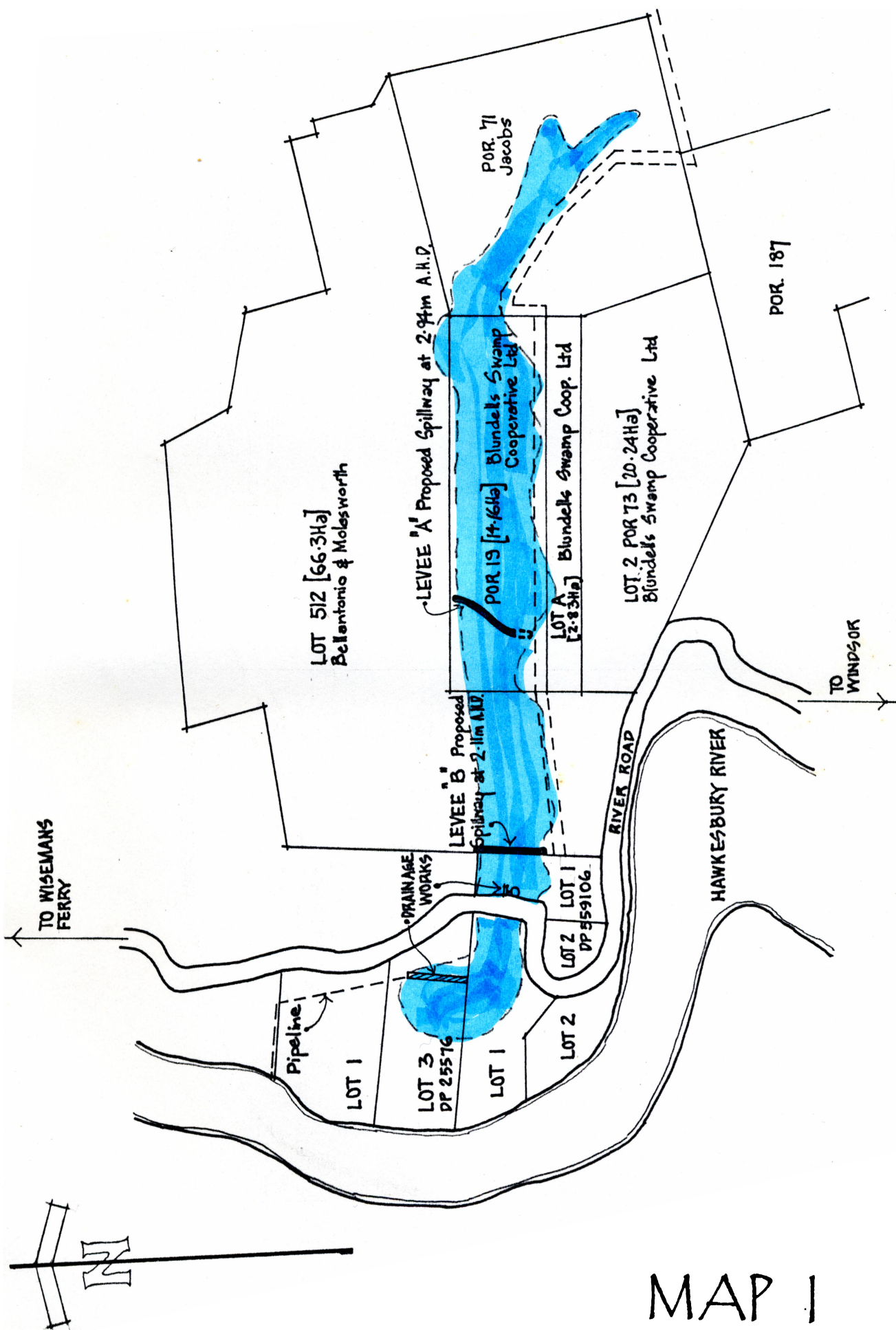




**Photograph C : Looking West from River Road in 1991.**

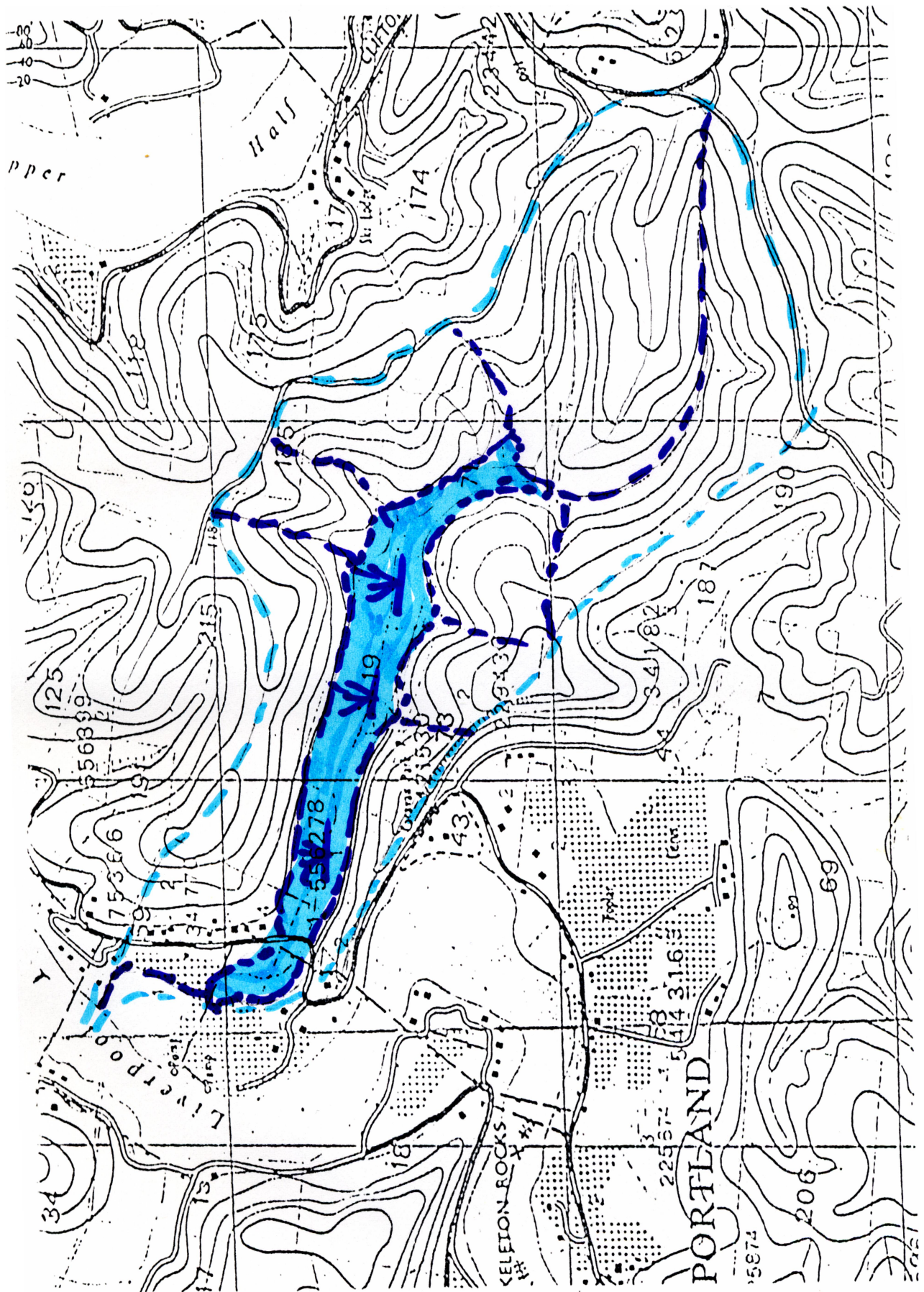


**Photograph D : Portion 19, looking East, 1992, shows the result of partial rehabilitation.**

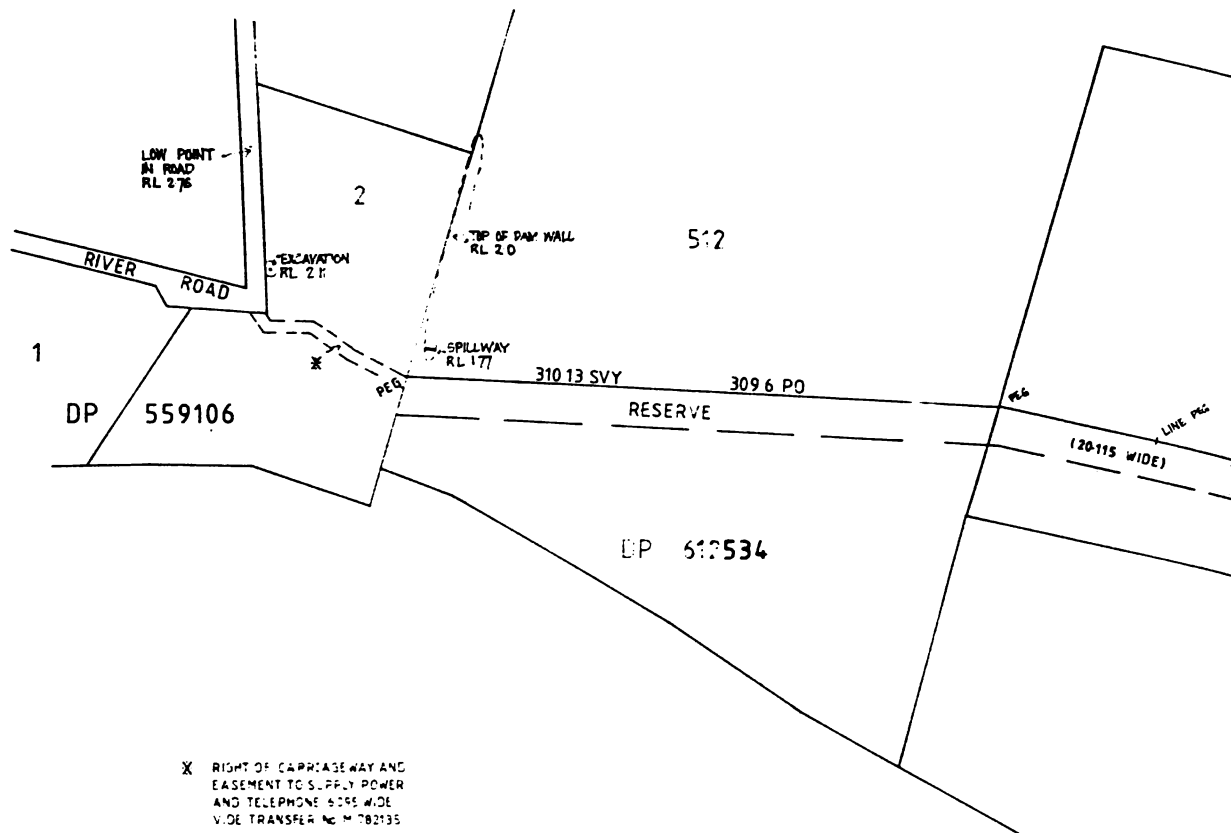


MAP 1



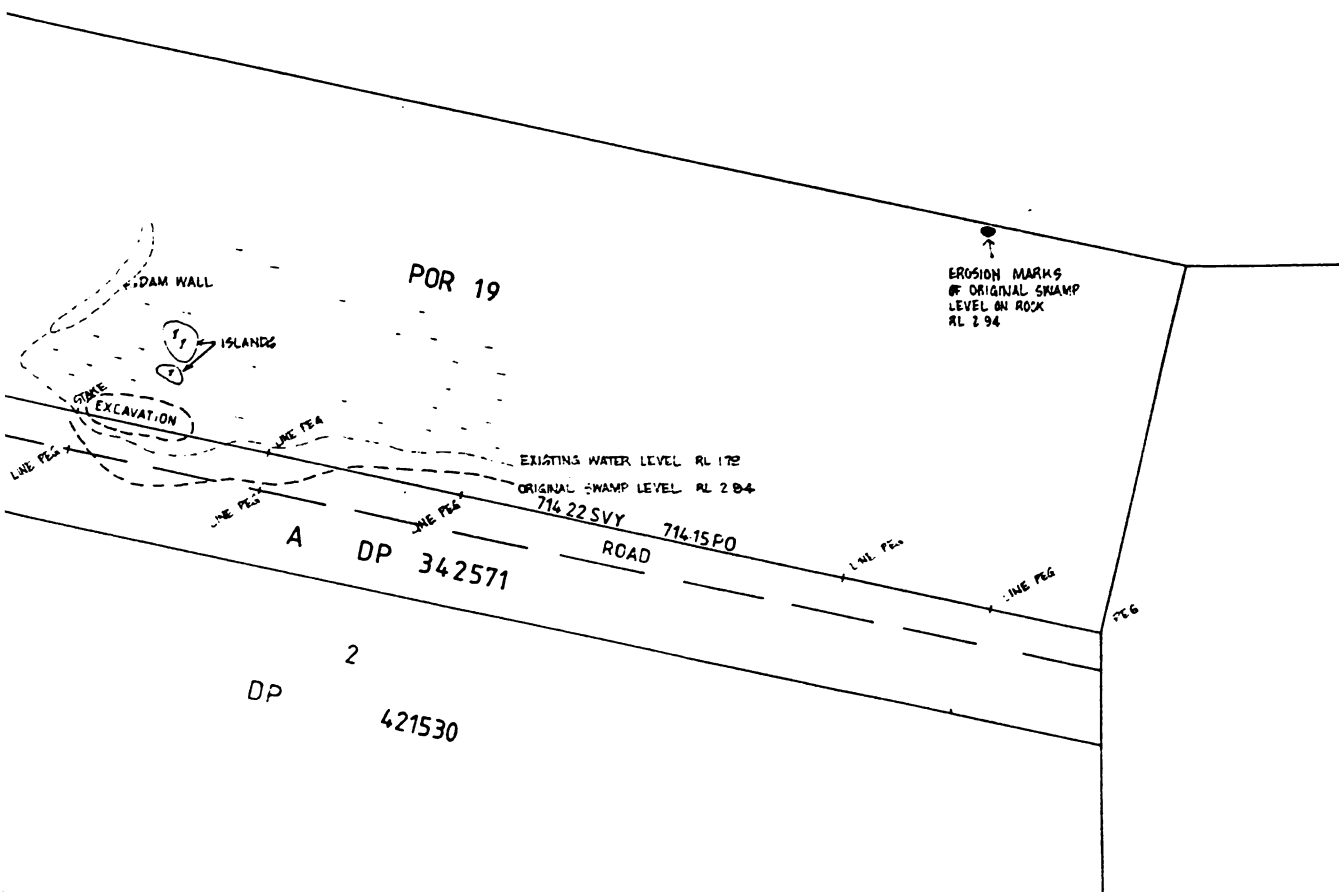


MAP 2



SURVEYOR  
THE SURV

NORMAN JOHN BRUHN  
Registered Surveyor  
69 JAMES STREET  
MORPE 232  
Phone 045 34155



## APPENDIX A

LOCATION : LOWER PORTLAND

PLAN SHOWING VARIOUS LEVELS IN  
PORTION 19, LOT A DP 342571, LOT 512  
DP 612534 & LOT 2 DP 559106

DATUM : AUSTRALIAN HEIGHT DATUM

ORIGIN OF LEVELS SSM 19969 RL 9.91

SCALE  
1 : 2000

REFERENCE  
MOLESWORTH

DATE  
29-7-92

REGISTERED UNDER  
EYORS ACT 1929

# **Appendix “B”**

**This section contains comments from the following :**

- 1. National Parks and Wildlife Service**
- 2. National Herbarium of N.S.W.**
- 3. Department of Water Resources**
- 4. Professor Paul Adam, University of N.S.W.**
- 5. Department of Planning**
- 6. Department of Conservation and Land Management**
- 7. N.S.W. Fisheries**





NSW  
NATIONAL  
PARKS AND  
WILDLIFE  
SERVICE

The General Manager  
Baulkham Hills Shire Council  
Showground Road  
Castle Hill NSW 2154

Attention; Mr. Michael Watt

Our reference:

Your reference:

Our Ref. F/015

7.4.94

Your Ref. P00790 & P01491

Dear Sir,

*re. Blundells Swamp*

I write in reference to the rehabilitation works proposed by Mr. Rodney Molesworth for this regionally important wetland.

It is widely recognised by ecologists working in the Sydney region that there remains very few quality wetland areas in the Hawkesbury River system. Blundells Swamp is one of them.

The NPWS has recognised the environmental significance of this area by declaring it a registered Wildlife Refuge. This classification was arrived at with the full knowledge and co-operation of the owners Mr. Molesworth and other members of the Blundell's Swamp Co-operative Ltd.

I was concerned to find therefore that the area's ecology had been damaged by inappropriate drainage regimes resulting from works possibility carried out by Council on the River Road reserve and at other places downstream of Blundells Swamp.

The matter was brought to the attention of the Service by Mr. Molesworth in 1993 and following a number of inspections of the area, and a meeting with Council officers, we have concluded that if this important wetland is to retain its high conservation values, further works will be required to ameliorate impacts resulting from previous off-site works which threaten the areas long term survival as a designated wetland.

North Metropolitan  
District  
Kyring-gai Chase  
National Park  
Bobbin Head  
Turrumurra 2074  
Fax: (02) 457 8265  
Tel: (02) 457 9322

Head Office  
43 Bridge Street  
Hurstville NSW  
Australia  
PO Box 1967  
Hurstville 2220  
Fax: (02) 585 6555  
Tel: (02) 585 6444

The Service has reviewed the document prepared by Mr. Molesworth which outlines the history of the issue and proposes what works are required to assist in the environmental rehabilitation of Blundells Swamp.

We strongly support the general thrust of this document and endorse Mr. Molesworth's intentions to fully rehabilitate this important wetland to its original state.

In particular we believe, in the interests of road users and those residents downstream who suffer occasional nuisance flooding, that it is essential that the levee wall formed by the River Road causeway across the mouth of Blundells Swamp be strengthened and raised, and that the existing sub surface drain be closed and replaced by a spillway.

Furthermore we recommend that appropriate planning controls be established over the entire catchment of Blundells Swamp which recognise the environmental worth of the area and which will assist the landholder in maintaining water quality within the swamp.

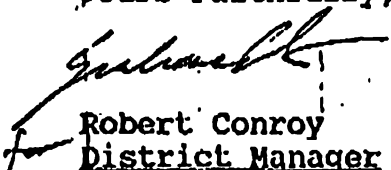
Of particular concern in this regard is the negative impacts inflicted on the lagoon's south western corner by high stocking levels of horses and the associated pollution of the waters by horse waste. The closure of the crown road reserve which runs adjacent to the swamp's southern edge and currently serves no useful purpose as a public thoroughfare is strongly recommended.

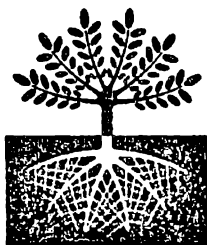
The NPWS is of the opinion that, given the intent of the landholder and the rehabilitative nature of the proposed works, a full environmental impact statement is not warranted.

It should be pointed out that the works already undertaken on the property to repair prior environmental damage to the swamp as a result of off-site activities, have to date been carried out entirely at the owner's expense. The imposition of further costs on the landholder in this matter would be most unfair.

The Service is happy to provide further information on this matter should it be required. Please contact Ranger Martin Smith at Cattai National Park on 045.728.404.

Yours Faithfully,

  
Robert Conroy  
District Manager  
for the Director General



# Royal Botanic Gardens Sydney

Mrs. Macquarie's Road, Sydney, NSW. 2000, Australia

Phone (02) 231 8111

In Reply Please Quote

National Herbarium of New South Wales

18th November, 1992

Mr R. Molesworth,  
17 Leichhardt Street,  
Glebe, N.S.W. 2037

Dear Mr Molesworth,

Re: Rehabilitation of Blundells Swamp

Thank you for the opportunity to comment on your proposed EIS to construct earthworks to partially restore natural water levels in Blundells Swamp.

We included this swamp in our study of the Conservation Value of Natural Vegetation along the Hawkesbury-Nepean River for the Department of Environment and Planning in July 1986 (Swamp Number 94). We classified it as having high conservation status as it had extensive areas of semi-permanent fresh swamp and some paperbark swamp, with essentially no evident current disturbance associated with grazing and draining. In our survey of 153 wetland locations, we encountered many cases of visible disturbance where obvious drainage works had reduced former swamp areas and grazing stock were present, for example, the area immediately to the west of River Road. Compared with areas like this, there was no evident disturbance, indicated by obvious signs of draining or grazing, to the main part of Blundells Swamp east of River Road at the time of our survey, and it contained extensive stretches occupied by wetland plants. It was our opinion that the swamp should be maintained in this state.

We are therefore concerned that, since 1986, drainage changes have taken place that allow the water to drain away rapidly, rather than drying out over a longer period and allowing the growth of ephemeral swamp vegetation around the margins.

Your evidence for the original (2.94m) high water level, in terms of soil changes and wave erosion on the rock is strong. Additional evidence for the high upper water level of the swamp is on the 1955 St Albans 1:63,360 military map which shows that according to 1954 aerial photos the swamp occupied most of the valley. Your plan to raise levees to enable the swamp to retain water at this level when at its peak would, in our opinion, benefit the plant species and the natural

environment of the swamp. Because of the overall shallow nature of the swamp, this higher peak water level would increase areas of semi-permanent swamp, rather than making a permanent swamp. The shallow nature of the margins would allow ephemeral native vegetation to colonize more extensive areas of drying mud, following wet episodes, than at present, thus providing better longterm species viability. Many of these species have been reduced in abundance in many other wetlands because of drainage works and grazing. Our observations of wetlands indicate that repeated alternating episodes of drying, exposure and flooding of shallow mud surfaces on swamp margins provide the natural conditions for reproduction of many swamp species. In this respect the rate of drying out is an important aspect of the habitat to which the plant species' life cycles have become adapted, and efforts to restore the original pattern are to be welcomed.

We suggest planting of additional groves of paperbarks propagated from local material, at and just above the reinstated high water level. The increased water level may affect some of the young paperbarks if we have an extended wet period, though observations at Longneck Lagoon indicate that some of these may be able to withstand very long periods of standing water especially if there are occasional dry periods. Staff of the Ecology Section would be happy to provide supervision and guidance on revegetation.

The Ecology Section has recently been commissioned by the Water Board to conduct a comprehensive survey of the vegetation of the entire Nepean-Hawkesbury catchment, and to develop a strategy for revegetation of riparian areas in the catchment. Recent field inspections and surveys as part of this project have reinforced the importance of retaining and protecting remaining floodplain wetlands such as Blundells Swamp. Extensive draining, modification and destruction of wetlands has severely reduced the area of habitat suitable for wetland plant species, and altered the growing conditions to which they have become adapted. Many wetlands have either been drained and converted to pastureland or dammed to produce artificially high and more permanent deep water bodies. Floodplain wetlands form a very important part of the river catchment. Their plant species and the birdlife and other fauna they support form a significant part of the natural heritage, and merit the highest protection. It is very welcome to see efforts made to reverse the effects of past modifications and drainage and to restore the previous natural conditions in Blundells Swamp.

Yours sincerely,

A handwritten signature in dark ink, appearing to read 'D.H. Benson', with a stylized, flowing script.

D.H. Benson  
SENIOR PLANT ECOLOGIST

## THE CONSERVATION VALUE OF NATURAL VEGETATION ALONG THE HAWKESBURY-NEPEAN RIVER

Ecology Section, Royal Botanic Gardens, Sydney, July, 1986.

A survey of the conservation value of natural vegetation along the Hawkesbury-Nepean River was carried out in 1986 by the Ecology Section of the Royal Botanic Gardens to provide information for the Department of Planning and Environment. The areas of concern included the foreshores, wetlands (including those on the floodplain) and escarpment areas of the Hawkesbury-Nepean River from Juno Point in Broken Bay to Pheasants Nest near Douglas Park. The alluvial flats of the tributary rivers MacDonald, Colo and Mangrove Creek were also included.

### Methods

Areas of natural vegetation associated with the Hawkesbury River, (riparian, wetlands and escarpment vegetation) were identified from aerial photos (Penrith 1979 1:40 000, St Albans 1984 1:25000 and Wollongong 1982 1:16,000 colour). Limited field checking was carried out, principally on the wetlands and riparian vegetation. Time constraints and access difficulties meant many areas received only a limited examination. In the field, floristic composition, presence of weeds and type of disturbance (grazing, clearing etc) were recorded. Wetland types are classified on the basis of species present and structure according to G.N Goodrick, Survey of wetlands of coastal New South Wales, CSIRO Tech Memo 5 (1970). Conservation values were based essentially on vegetation and were assessed from extent, condition and floristic composition of plant communities. The values to waterbirds and other wildlife have not been investigated.

MAP NUMBER	94
NAME AND LOCATION	Liverpool Reach Lower Portland 052 986
WETLAND TYPE	Freshwater wetland
VEGETATION	Semi-Permanent Fresh Swamp and Paperbarks swamp
MAIN SPECIES	Juncus usitatus, Phragmites australis, Melaleuca linariifolia, Eleocharis sphacelata.
DISTURBANCE	None
CLASSIFICATION	2
MAP NUMBER	95
NAME AND LOCATION	Just over Colo Bridge Lower Portland 032 984
WETLAND TYPE	Freshwater wetland
VEGETATION	Semi-Permanent Swamp Fresh Swamp, Paperbark swamp.
MAIN SPECIES	Phragmites australis, Eleocharis sphacelata, Juncus usitatus, Melaleuca linearifolia, Acacia parramattensis.
DISTURBANCE	Drainage, modification.
CLASSIFICATION	3
MAP NUMBER	96
NAME AND LOCATION	Turnbulls Swamp Lower Portland 005 972
WETLAND TYPE	Freshwater wetland
VEGETATION	Fresh meadow
MAIN SPECIES	Juncus usitatus, pasture grasses
DISTURBANCE	Grazing, clearing, soil extraction.
CLASSIFICATION	
MAP NUMBER	97
NAME AND LOCATION	- Lower Portland 013 996
WETLAND TYPE	Freshwater wetland
VEGETATION	
MAIN SPECIES	
DISTURBANCE	
CLASSIFICATION	
MAP NUMBER	98
NAME AND LOCATION	Whatleys Creek Lower Portland 969 005
WETLAND TYPE	Freshwater wetland
VEGETATION	Paperbark swamp and small area of fresh meadow
MAIN SPECIES	Melaleuca linariifolia, Juncus sp.
DISTURBANCE	Grazing.
CLASSIFICATION	3
MAP NUMBER	99
NAME AND LOCATION	Wheeny Creek Lower Portland
WETLAND TYPE	Freshwater wetland
VEGETATION	Semi - Permanent fresh swamp with open fresh water.
MAIN SPECIES	Eleocharis sphacelata, Juncus usitatus, Persicaria sp Nymphaea capensis, Acacia parramattensis, Melaleuca linariifolia, Triglochin procera, Philydrum lanuginosum.
DISTURBANCE	Grazing around margins
CLASSIFICATION	2
MAP NUMBER	100
NAME AND LOCATION	Gees Lagoon Lower Portland 952 991
WETLAND TYPE	Freshwater wetland
VEGETATION	Semi-Permanent Fresh Swamp with open Fresh water,

Mr. R. Molesworth  
17 Leichardt Street  
GLEBE NSW 2037

Telex: 121188  
Facsimile: (02) 895 7281  
Telephone: (02) 895 6211  
Ext: 7441  
Contact Name: John Ross  
Our Reference: 0065105  
[AKW-0944#]

17.12.92

11st Feb

Dear Mr Molesworth,

**Re: EIS Rehabilitation of Blundells Swamp**

Thank you for your letter of 9 October 1992 seeking comment on the above EIS. The Department has examined the documentation provided and proffers the following comments.

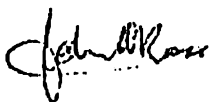
Blundells Swamp is an important wetland that has survived partially intact despite drainage and agricultural activities. It is a wildlife reserve and is listed as Wetland No. 94 in the mapping that accompanies the Sydney Regional Environmental Plan No. 20. REP 20 was implemented to prevent the continued destruction of wetlands in the Sydney region. Most of the region's wetlands have been destroyed or severely modified by various human uses, considerably reducing the available habitat for wetland plants and animals. Many of the other functions of the wetlands have been similarly compromised or lost, such as flood detention and water quality improvement through nutrient stripping.

The original drainage works, probably built decades ago, were abandoned and allowed to deteriorate. It is no longer clear whether these works were legal or not. However, it would seem clear from Department's research that the more recent drainage works are not licensed. These works would appear to need a licence as do the works constructed by occupants on the upstream properties (Lot 512 and Portion 19) which are the subject of this EIS. These works were apparently undertaken to minimise damage to the subject wetland and to rehabilitate it to some extent. The evidence corroborates this stated intent.

The EIS provides sufficient information to support its conclusions that the proponents, works are the best interim solution to rehabilitating the wetland and that such rehabilitation is necessary. It also provides sufficient justification for the preferred option to be adopted, i.e. cessation of all drainage. This is supported so long as support of council (or owner of the road) can be gained for the necessary modifications to permit wet weather access. In any case if the drainage works are confirmed to require a licence, then the licence applicant will need to justify the benefits of the drainage against the continue environmental degradation.

I trust the above comments will prove useful to you and to Council's officers should you wish to further discuss the matter with them.

Yours sincerely,



John A. Ross



# THE UNIVERSITY OF NEW SOUTH WALES

SCHOOL OF BIOLOGICAL SCIENCE • PO BOX 1 • KENSINGTON • NSW • AUSTRALIA 2033  
TELEX: AA26054 • TELEGR.: UNITECH, SYDNEY • FAX: (02) 6622913 • Ph.: (02) 6972067

4th March, 1993

Mr. R. Molesworth,  
17 Leichhardt Street,  
GLEBE. NSW 2037

Re: Blundells Swamp

Dear Mr. Molesworth,

It is now generally accepted that wetlands are an important component of the landscape for at least three major reasons:

- for their role in the hydrological cycle
- for their role in various geochemical cycles

Wetland management and conservation are now given high priority by both Federal and State governments.

Unfortunately, prior to the realisation of wetland values many wetlands in Australia had been destroyed or substantially modified. Wetlands on the lowland flood plains of coastal rivers have been particularly badly hit, being reclaimed for agriculture and drained in the name of flood mitigation.

Blundells Swamp exemplifies many of the problems which beset wetlands. What was a functional ecological unit - the wetland and its catchment - has been arbitrarily separated into a series of parcels of land which have been managed without consideration for the whole. As a result of this "tyranny of small decisions" the integrity of the system has been lost and the maintenance of the ecological values and functions of the remaining wetland area severely impaired.

If wetland values are to be retained it is important that the hydrological regime be restored as far as is possible. The works that you are proposing should be regarded as the minimum necessary to achieve this end (unfortunately owing to the fragmentation of the whole wetland it is probable that your proposal will be the maximum that is practical).

I commend you for your efforts to retain the values of a wetland which was identified as significant in REP20 and wish you every success.

Yours sincerely,

Paul Adam  
Assoc. Professor





# Department of Planning

Messrs Bellantonio & Molesworth  
Blundells Swamp Co-op  
17 Leichhardt Street  
GLEBE NSW 2037

Remington Centre  
175 Liverpool Street, Sydney 2000  
Box 3927 G.P.O. Sydney 2001  
DX. 15 Sydney

Telephone : (02) 391 2000 Ext:  
Fax No : (02) 391 2111

2083

Contact: M. Beveridge

Our reference : S91/06787

Your reference :

21 OCT 1991

Dear Sirs,

REHABILITATION OF SYDNEY R.E.P.20 WETLAND NO.94  
KNOWN AS BLUNDELLS SWAMP

Thank you for your letter of 19 September 1991 indicating that you are consulting with the Director with regard to the preparation of an environmental impact statement (EIS) for the above development.

2. As development consent is required for the proposal and it is a designated development pursuant to Sydney Regional Environmental Plan No 20 - Hawkesbury/Nepean River, an EIS must accompany the development application to the Baulkham Hills Shire Council. The EIS shall be prepared in accordance with clause 34 (copy attached) of the Regulation and shall bear a certificate required by clause 26(1)(b) of the Regulation.

3. In addition, pursuant to clause 35 of the Regulation, the Director requires that the following matters be specifically addressed in the EIS:

Description of the proposal, and its impact on the existing hydrologic regime, and the ecological values of the wetland.

measures to control changes to water quality during construction of the levees.

impact of the proposal on the flooding characteristics of the area, and means to minimize any impacts.

a brief description of the wetland prior to the commencement of any unauthorised works (including any which are the subject of this present application) including:

- i) the drainage
- ii) vegetation and any weed infestation.
- iii) fauna of the site and habitat values.

If these characteristics of the wetland have altered since 1988, this should be discussed.

- . description of the proposed methods for the restoration of the wetlands.
- . a discussion of the expected changes to the wetland resulting from the restoration program, and a description of perceived benefits and improvements to the wetlands function and values.

4. In preparing your EIS, you are advised that as the intention of your proposal is to restore the wetlands, it will not be necessary to include detailed technical information about the proposal. Rather, the EIS should be brief and should concentrate on explaining the benefits of the project, and demonstrate how the restoration procedures would enhance the value of the wetland, and not lead to further damage.

5. You should also approach Baulkham Hills Council, NSW Fisheries, National Parks and Wildlife Service and the Department of Conservation and Land Management (Soil Conservation Service) and take into account any comments they consider may apply to the determination of the proposal.

6. Should you require any further information regarding this matter please do not hesitate to contact us again.

Yours faithfully



Peter Hamilton  
Manager  
Assessments Branch  
As Delegate for the Director



DEPARTMENT OF  
CONSERVATION AND  
LAND MANAGEMENT

Macquarie Tower  
10 Valentine Ave  
PO Box 1416  
Parramatta NSW 2150

Phone (02) 895 7503  
Fax (02) 895 7501

Mr Rodney Molesworth  
17 Leichhardt Street  
GLEBE NSW 2037

Contact: Mr Matt Corbett

Our Ref: M21007; M162

Dear Sir,

RE: BLUNDELL'S SWAMP

I refer to your letter of 9th October, 1992, requesting comment on the draft Environmental Impact Statement for the subject site.

The Department of Conservation and Land Management (formerly the Soil Conservation Service) offers the following comments.

Reference is made to the Soil Conservation Service, now incorporated into the Department of Conservation and Land Management, in the draft document. In Section 1.2.4 reference is made to sedimentation and reduced water quality as a result of construction to date, stating that a Soil Conservation Service officer noted that neither of these problems had occurred. The actual observation made was that off-site sedimentation had not occurred but no reference was made to water quality. Also, this Department can offer occasional on-site comment on the proposed structures during construction but is unable to provide construction supervision.

The Department would appreciate the opportunity to comment on the designs of the proposed levees once they have been prepared.

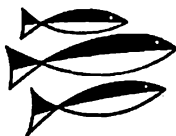
Enclosed is a pamphlet on the Rivers and Foreshores Improvement Act which relates to your proposed works.

If you require further information please contact me on 895 7503.

Yours faithfully,

*Matt Corbett*

Matt Corbett  
for O.P. Graham  
District Manager  
PARRAMATTA  
28th October, 1992



## Brackish Water Fish Culture Research Station

R P C Molesworth  
Blundell's Swamp Co-op Ltd  
17 Leichhardt Street  
Glebe NSW 2037

Post Office Salamander Bay  
N.S.W. 2301

Telephone: (049) 82-1232  
Facsimile: (049) 82-1107

Our reference:  
Your reference:

chm.1042.1

10 April 1992

Dear Sir/ Madam,

### Re: Rehabilitation of Blundell's Swamp

Thank you for your recent correspondence regarding the preparation of an Environmental Impact Statement (EIS) for the above project.

NSW Fisheries has statutory responsibilities for the protection of the fisheries resources of New South Wales and requires that an assessment of the potential impact on fish and fisheries resources be included in the EIS, however, given the circumstances of this project, this assessment need not be exhaustive. The EIS should, as far as possible, identify the previous condition of the swamp and provide evidence demonstrating previous water levels.

Please find enclosed a copy of the NSW Fisheries publication "Estuarine Habitat Management Guidelines" which provides background information for works liable to impact on waterways and gives further general requirements of NSW Fisheries. The relevant sections of the document should be referred to during the preparation of the EIS.

NSW Fisheries supports and commends any project that aims to protect or restore valuable wetland habitats.

For further liaison with NSW Fisheries regarding this proposal please contact Mr Neil Hughes, Biologist (Habitat Management) on (049) 821232.

Yours faithfully

(Neil Hughes)

For:

RA Claxton

Director, NSW Fisheries